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useful current hand-book on the West Indies, but a contribution of permanent value to the literature of that part of the western hemisphere. It is admirably printed, artistically bound, amply illustrated, satisfactorily indexed, and well arranged for reference, as well as for consecutive reading.

W J M.

*The Birds of Indiana.* By AMOS W. BUTLER. 22d Report of the Department of Geology and Natural Resources of Indiana. 1897. 8vo. Pp. 515-1187. 5 plates and numerous cuts in the text.

Commissions for the preparation of State Natural History Reports so often fall into incompetent hands that all ornithologists, and particularly those students of birds residing in the State of Indiana, may congratulate themselves that a person so well qualified as Mr. Butler was selected to write the work under consideration.

The matter relating to the birds known to occur in Indiana is preceded by sections on the 'Indiana Bird Law,' the physiography of the State (from Dryer's 'Studies in Indiana Geography'), 'Peculiarities affecting Bird Distribution,' 'Changes in Bird-Life,' 'Destruction of Birds,' 'Zoological Areas' and 'Bird Migration.' There is also a bibliography giving some 212 titles.

This is followed by keys to the orders, families, genera and species, and biographies of the 321 species recorded from Indiana, including descriptions of their plumages, general and local ranges, nests, eggs, times and manner of occurrences and habits. The report, in fact, is a complete ornithology of Indiana.

Mr. Butler has followed the excellent plan of securing the best available material, for the use of which he makes ample acknowledgment. Thus his keys are taken from Ridgway's and Jordan's 'Manuals,' his illustrations from the publications of the U. S. Biological Survey and Coues's 'Key,' while the number of local observers quoted assures us that the work contains all existing and desired information and that it will long remain the standard authority on Indiana birds. We trust, therefore, that a sufficiently large edition has been printed to

prevent its early classification with other State lists, which become 'out-of-print' before those who could make the best use of them learn of their existence.

F. M. C.

*The Butterfly Book.* A Popular Guide to a Knowledge of the Butterflies of North America. By W. J. HOLLAND. New York, Doubleday & McClure Co. 1898. Imp. 8vo. Pp. xx + 382. 48 colored plates. 183 figures in the text. Price, \$3.00.

As the secondary title indicates, this work was prepared to meet a popular need. The preface says: "It is essentially popular in its character. Those who seek a more technical treatment must resort to the writings of others." Nevertheless, it will 'have utility also for the scientific student,' since 'the successful development in recent months of the process of reproducing in colors photographic representations of objects has been, to a certain degree, the argument for the publication' of the work. The forty-eight plates have been reproduced by the new process known popularly as 'three-color printing,' and this is its first application so far as we know—certainly on such a scale—to butterflies. It is, however, an unquestionable and surprising success, destined—if the extraordinarily low price at which the book is sold be any guide—to come into very general use. The representation of the colors as well as of the pattern outstrips all that can be done by chromolithography, and has the added value of an accuracy unattainable except at the high cost of the very best workmanship. As the photographic method employed requires the use of a screen, as in so-called 'half-tone' work, there is a certain loss of vividness, but it appears to be even less than is ordinarily the case with half-tones from a photographic print. This may be seen by an examination of the five plates of caterpillars and chrysalids copied from my 'Butterflies of the Eastern United States,' where direct comparison is available. There are, it is true, a few, but very few, unaccountable and generally very slight changes in tint (as in Pl. 2, Fig. 20; Pl. 3, Fig. 18, and Pl. 5, Fig. 3), and occasionally a blurring, or at least a loss of sharpness, due to imperfect registering, but such mishaps would

ordinarily be noticed only by an expert, so that we must welcome this new process as a great boon. How different copies agree we have not tested.

We have spoken thus in detail regarding the plates, not only from our hope regarding this new process, but because of their special value from a scientific point of view; a large number of the figures being, Chancellor Holland states, photographic reproductions from the types of the butterflies described. Strange to say, it is only in a very few instances that the author has specified *which these are*, and so he has lost an easy opportunity of adding greatly to their value.

Not all the North American species are described or figured in the work, the author quailing before the numerous and rather insignificant Hesperidæ, of which but little more than one-half are treated, and omitting many others found in our lists, but either of doubtful specific validity or differing from their allies by distinctions too fine for any but the expert. This is in the interest of the popular audience to which the work appeals. It is, in fact, an iconography of all the forms interesting an amateur, and more. The only really desirable addition would have been to give more figures of the under-surface where this is characteristic, but one should not quarrel with the generosity here displayed; none can possibly complain that he does not get his money's worth, at least.

As to the text of the work, the first fifth of the book is given up to introductory matter on structure, collecting, etc., and the remainder (except a few interspersed essays) to a systematic but very general account of the insects figured, with very many text illustrations, principally of neurulation. The different groups are described as well as the species—a desirable feature, but one not altogether common in popular works; and the classification used is more modern than in most of such books. The author's use of genera is not equal, and is 'conservative'—that is, there are many magazine genera here and there, but with a tendency to the discrimination of later times. The descriptions of the species are short—often very short; and attention is paid to the early stages, but almost absolutely none at all to life-histories,

which should be one of the principal aims in a popular treatise.

The work will surely command a large sale and prove a great stimulus to the study of butterflies. Certainly we have never before had such a generous aid to those wishing to cover the whole field. Why should the publishers stamp the cover 'The Butter-Fly Book?' The author surely is not responsible for this, for the proofs have been well read. The publishers have, otherwise, done their part well; the topography is clear and careful, and there is a good index.

SAMUEL H. SCUDDER.

#### BOOKS RECEIVED.

*Michael Faraday, his Life and Works.* SYLVANUS P. THOMPSON. New York, The Macmillan Co. 1898. Pp. x + 308.

*The Elements of Physics.* EDWARD L. NICHOLS and WILLIAM S. FRANKLIN. Vol. I., Mechanics and Heat. New edition, revised with additions. New York, The Macmillan Co. 1898. Pp. xiii + 219. \$1.50.

*Principles of Plant Culture.* E. S. GOFF. Madison, The Author. 1899. Pp. 287.

#### SCIENTIFIC JOURNALS AND ARTICLES.

THE *Psychological Review* for January opens with Professor Münsterberg's presidential address before the American Psychological Association, the subject being 'Psychology and History.' This address, together with other articles that Professor Münsterberg has recently published in the *Atlantic Monthly* and elsewhere on the subject-matter of psychology and its relations to other sciences and to philosophy, will shortly be issued in book form by Messrs. Houghton, Mifflin & Co. Professor J. R. Angell and Miss H. B. Thompson contribute from the laboratory of the University of Chicago a study of the relations between certain organic processes and consciousness, elaborately illustrated with tracings of pulse and breathing. Mrs. C. Ladd Franklin publishes her paper on Professor Müller's 'Theory of the Light-sense,' read before the recent meeting of the American Association. There are other articles on 'Theories of Play,' by Mr. H. M. Stanley; on 'Eucken's Struggle for a Spiritual Content of Life,' by Professor Francis Kennedy, and on 'The Effects of Ether.'